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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,847	12/16/2003	Pertrus Rutgerus Bartray	081468-0307226	3169

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,847

Applicant(s)

BARTRAY ET AL.

Examiner

Hung Henry V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Since the applicant has amended claim 23 to recite specifically that the reference frame is used in a lithographic apparatus, the restriction is hereby withdrawn.

Drawings

2. The formal drawings are required in this application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Narushima (WO99/28957).

With respect to 20, Narushima discloses a reference frame for use in a lithographic apparatus (see figure 4) comprising all of the limitations of the instant claims such as a reference member which is formed of a ceramic material of a low thermal expansibility. It is noted that it is well known in the art that the coefficient of thermal expansion of the ceramic material is about $3 \times 10^{-6} /K$.

As to claims 21-22, it is well known per se that ceramic material having a specific heat of 700 (J/kg K) and the thermal conductivity of 170 (W/(m.K)). (For example, see table 1 on page 12 of the specification).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 6-10, 12-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novak et al (U.S.Pat. 6,674,512) in view of Trost (U.S 2002/0154839 A1).

As to claims 1-3, 6-10, 12-23, Novak et al discloses an exposure apparatus for transferring a predetermined pattern formed on a mask onto a substrate and comprising substantially all of the limitations of the instant claims including: an illumination system for providing a beam of radiation (see col.1, lines 24-25); a supporting structure (RS) for supporting the mask (40) ; a substrate support (30) for supporting the substrate (W) ; a projection system (PL) for projecting the patterned beam onto the substrate (see figure 4) and a reference frame (MR) for providing a reference surface with respect to which a position of at least one of the substrate and the mask prior to exposure. Novak does not specifically disclose the reference frame made of a material having specific coefficient of thermal expansion, or a specific heat, and specific thermal conductivity as specified in the instant claims. Trost discloses stage system for used in an exposure apparatus, and having a worktable (200) that functions to support plate 32

and provide a reference for measuring plate position. In order to reduce thermal drift, Trost suggests that the worktable 200 including a stage mirror 202 are formed from any ceramic material having a very low coefficient of thermal expansion (see section [0039]). In view of these teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Novak and Trost to obtain the invention as specified in the instant claims. It would have been obvious to a skilled artisan to employ suitable material having specific coefficient of thermal expansion, or a specific heat, and specific thermal conductivity as specified in the instant claims, as suggested by Trost to make the reference frame of Novak, for the purpose of preventing thermal expansion of the reference frame and improving the accuracy of the measuring system. Also, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin. 127 USPQ 416.

7. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novak et al (U.S.Pat. 6,674,512) in view of Trost (U.S 2002/0154839 A1) and further in view of Baker et al (U.S.Pat. 6,262,795).

With respect to claims 4-5, Novak et al as modified by Trost, does not specifically disclose the beam of radiation having wavelength of 348 nm or less than about 348 nm. Baker teaches a photolithographic system for transferring a predetermined pattern formed on a mask onto a substrate, and having polychromatic light sources such as argon lamps or fluorescent lights (wavelength in the region of or shorter than 348 nm) (see col.4, lines 35-45). It would have been obvious to one having ordinary skill in the art at the time the invention was made to

Art Unit: 2851

employ a light source having a wavelength in the range of or shorter 348 nm, as taught by Baker into the lithographic apparatus of Novak, as modified by Trost, for the purpose of providing a proper illumination and improving the resolution of the images to be printed.

8. Claim 11 is rejected under 35 U.S.C. 103(a) being unpatentable over Novak et al (U.S.Pat. 6,674,512) in view of Trost (U.S 2002/0154839 A1) and further in view of Shiraishi (U.S.Pat. 6,020,950).

With respect to claim 11, Novak et al as modified by Trost, lacks to show a cooling device for controlling the temperature of the reference frame. Shiraishi teaches a cooling device for cooling a member of an exposure apparatus (see figure 5). It would have been obvious to a skilled artisan at the time the invention was made to combine the teachings of Shiraishi, Novak and Trost to obtain the invention as specified in claim 11 of the present application. It would have been obvious to a skilled artisan to employ the cooling device as taught by Shiraishi to cool off the reference frame of Novak as modified by Trost for the purpose of preventing the reference member from being deformed by thermal expansion and thus improving the quality of the exposure device.

Prior Art Made of Record

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

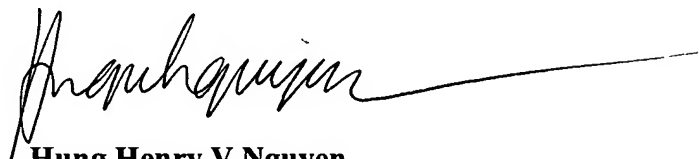
Waggener et al (U.S.Pat. 5,644,137) discloses stabilizing support mechanism for exposure apparatus having reference plate composed of a low coefficient of thermal expansion.

Art Unit: 2851

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hung Henry V Nguyen
Primary Examiner
Art Unit 2851

hvn
11/2/03